[0039] **CLAIMS**

[0040] We claim:

[0041] 1. A method of removing a portion of the elemental mercury in a flue gas created during a combustion process, comprising:

providing four streams, wherein the first stream comprises a halogen containing reagent, the second stream comprises a sorbent, the third stream comprises conveyance air, and the fourth stream comprises a flue gas containing elemental mercury;

combining the first, second, and third streams wherein the halogen containing reagent is adsorbed onto the sorbent;

injecting the combined stream into the fourth stream;

adsorbing the elemental mercury onto the sorbent; and

removing the sorbent from the fourth stream.

[0042] 2. The method according to claim 1, wherein the flue gas is created during the combustion of at least one of a fossil fuel and municipal solid waste.

[0043] 3. The method according to claim 2, wherein the fossil fuel comprises coal.

[0044] 4. The method according to claim 1, wherein the halogen containing agent comprises at least one of chlorine, bromine, iodine or fluorine and halide derivatives thereof.

[0045] 5. The method according to claim 1, wherein the sorbent comprises a carbonaceous sorbent.

[0046] 6. The method according to claim 5, wherein the carbonaceous sorbent comprises at least one of powdered activated carbon, carbons and chars produced from coal and other organic materials, and unburned carbon produced by a combustion process.

[0047] 7. The method according to claim 1, wherein the first and second streams are combined at a temperature between about 0C and about 50C.

[0048] 8. The method according to claim 1, wherein the first, second and third streams are first combined just prior to injection of the combined stream into the fourth stream.

[0049] 9. The method according to claim 1, wherein the combined stream is injected into the fourth stream at a location where the temperature of the fourth stream is below about 175C.

[0050] 10. The method according to claim 1, further comprising the step of adsorbing a substantial portion of oxidized mercury present in the flue gas in addition to the elemental mercury in the fourth stream.

[0051] 11. The method according to claim 1, further comprising the step of using a fabric filter to remove the sorbent from the fourth stream.

[0052] 12. The method according to claim 1, further comprising the step of using an electrostatic precipitator to remove the sorbent from the fourth stream.

[0053] 13. The method according to claim 1, wherein the fourth stream is provided with up to about 4 moles of halogen per million moles of flue gas, and at least about 0.1 pounds of sorbent per million cubic feet of flue gas.